The study of apricot kernel oil resistance to oxidation

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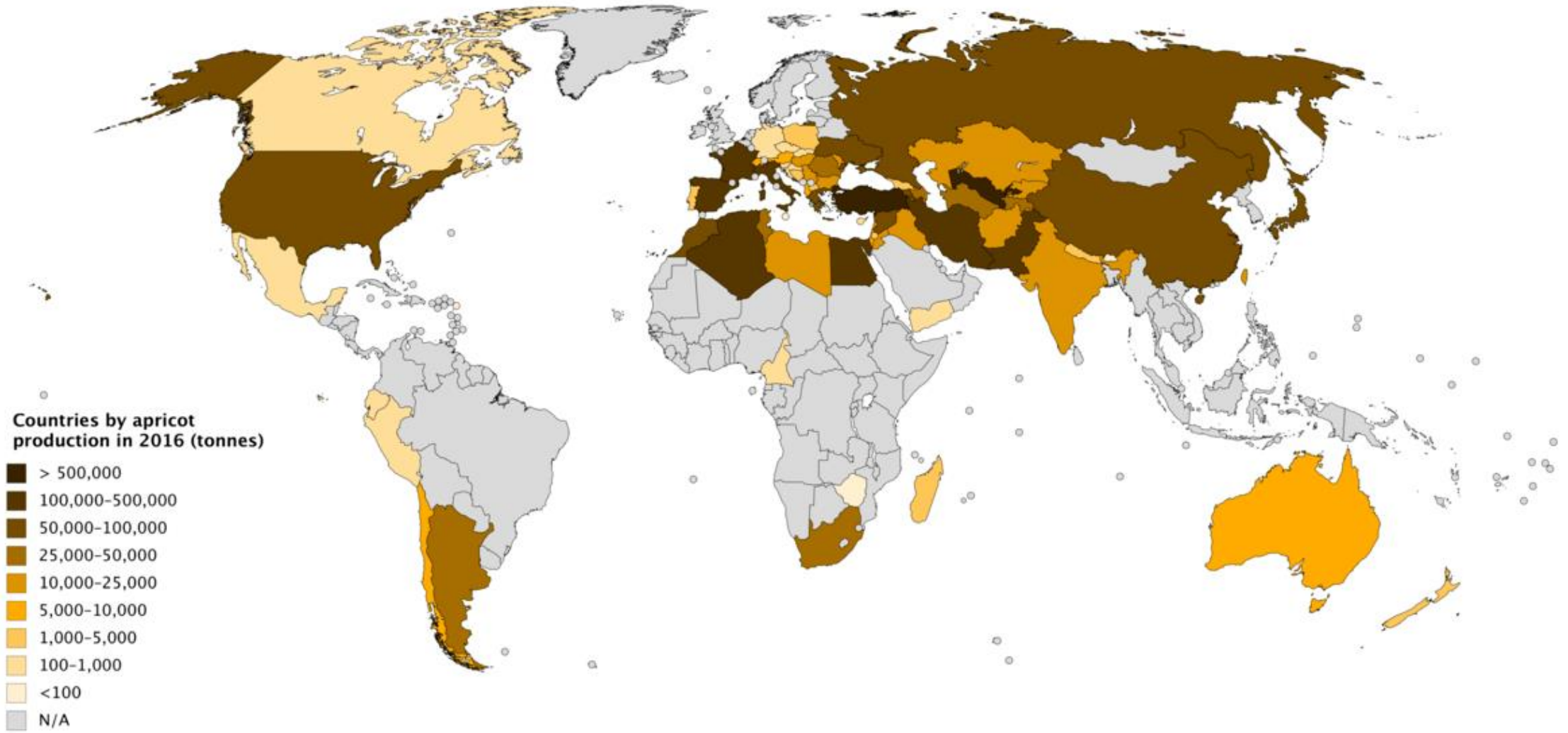
World production of apricots



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Apricot kernel oil

Essential oil

Chemical industry

Edible oil

Pharmaceuticals

Biofuels

Cosmetics

Feed additives

The aim of the study was to evaluate the resistance to oxidation of two commercial cold pressed oils from apricot kernel: M1 and M2. The oils came from two different factories located in Poland

M1 – apricot kernel oil (*Prunus armeniaca L.*), cold pressed, unrefined, country of origin: Poland, Silesia province

M2 - apricot kernel oil (*Prunus armeniaca L.*), cold pressed, unrefined, country of origin: Poland, Lesser Poland province

Determination of acid value by automatic titrator TitraLab AT1000 Series with combined electrode: N 6480 eth.
M1: 3.77 ± 0.78 mg KOH/g of fat
M2: 0.50 ± 0.11 mg KOH/g of fat

Determination of fatty acid composition by GC method

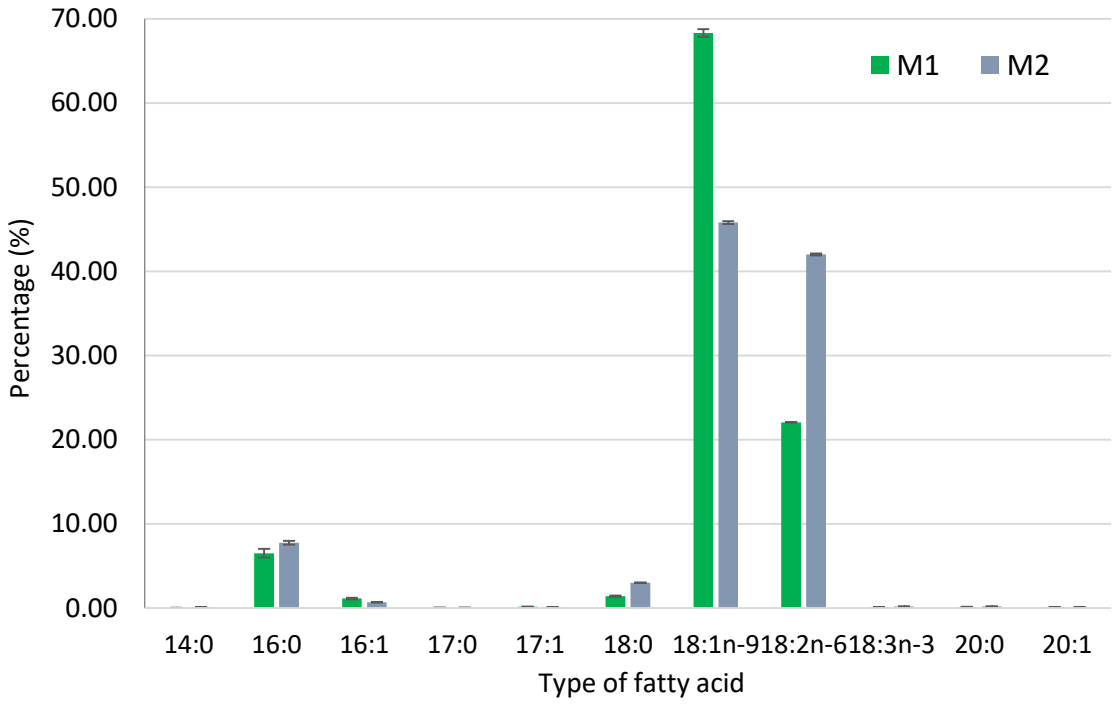
Determination of induction time by PDSC method in 100, 110, 120, 130, 140°C

Analysis of distribution of fatty acids between the positions of triacylglycerols as the percentage content of a fatty acid in the sn-2 position by TLC and GC method

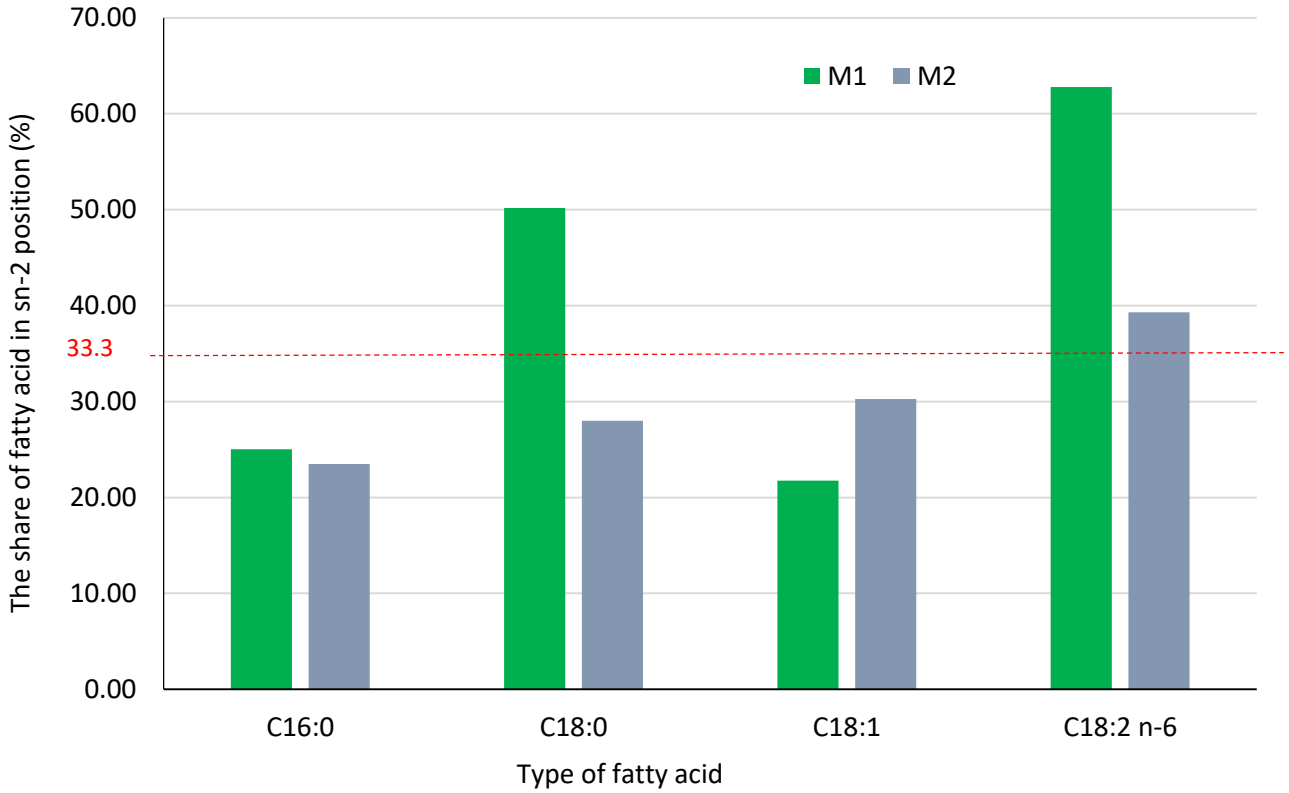
Analysis of melting profile by DSC method

Results and discussion

Fatty acid composition



Positional distribution of fatty acids between the positions of triacylglycerols



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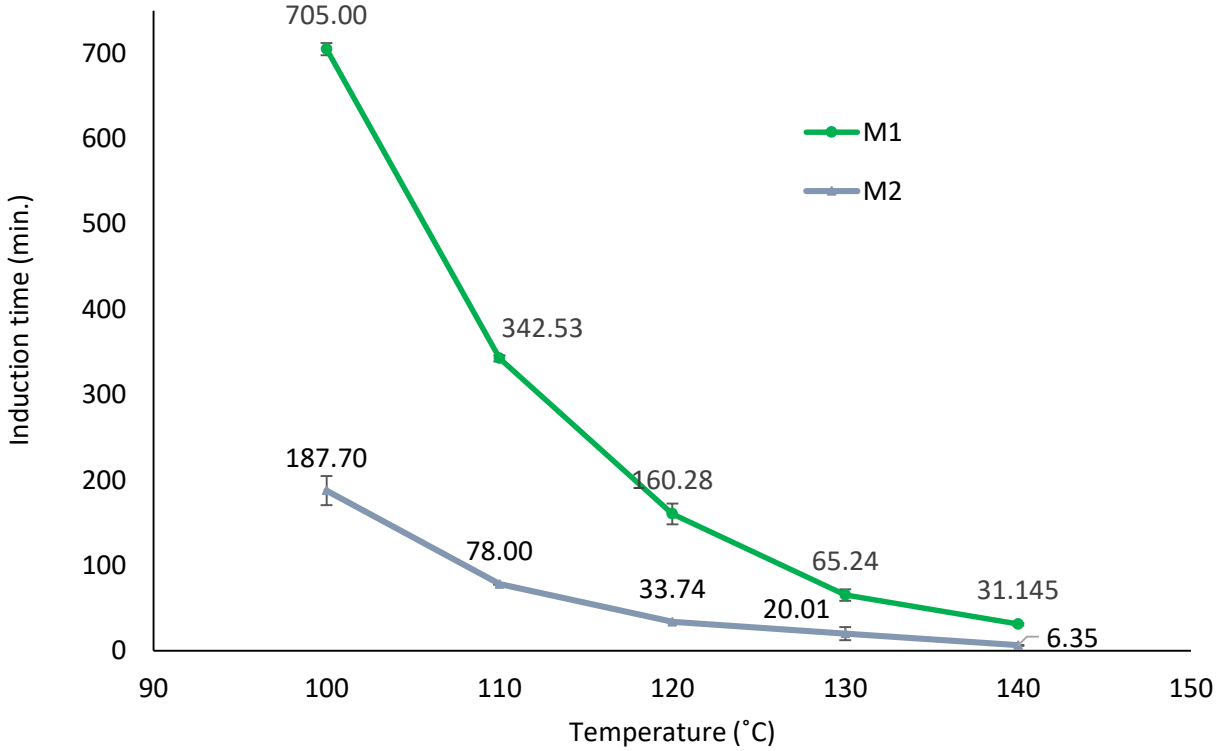
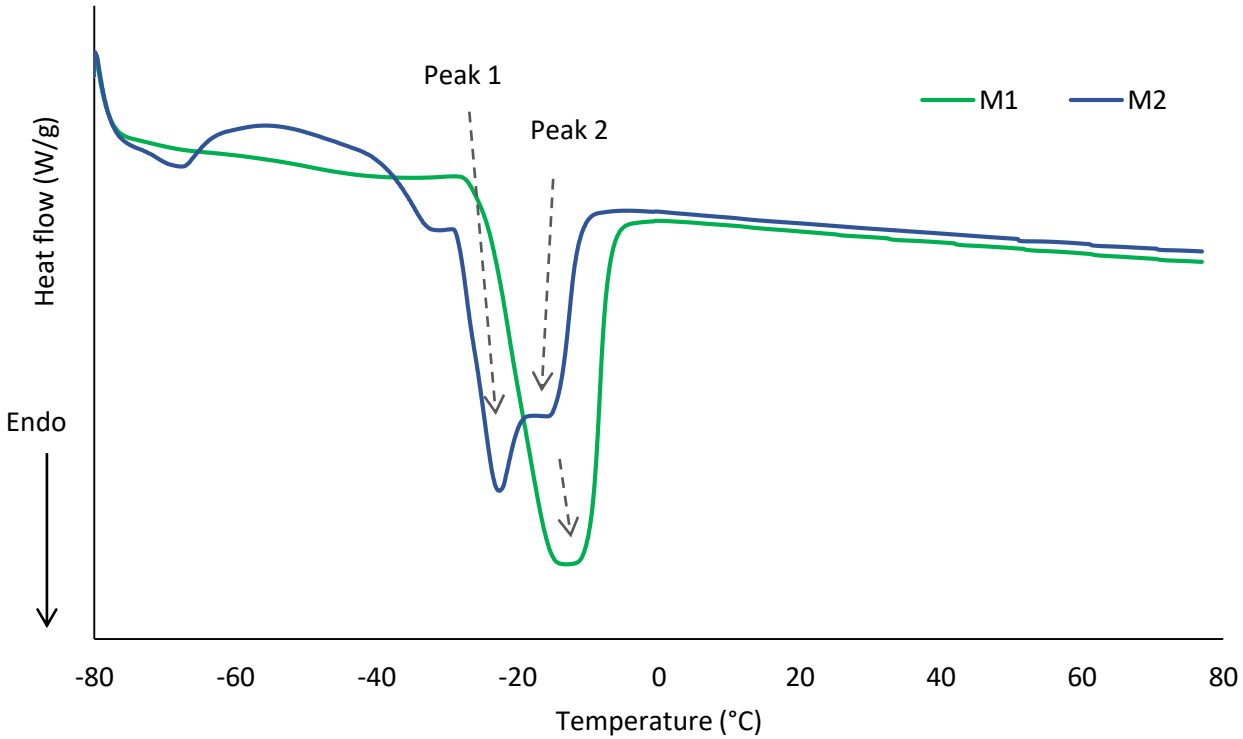
Results and discussion

Induction time in 100, 110, 120, 130, 140°C



Melting profile



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Conclusions

- Apricot kernel oils contained mainly unsaturated fatty acids in the amount of 91.89 and 88.92 %, of which oleic acid (68.33 and 45.81 %) and linoleic acid (22.07 and 42.01 %) were detected in the highest amount. Saturated fatty acids were mainly represented by palmitic and stearic acids.
- Tested oils met the requirements of Codex Alimentarius for edible fats and oils, which determines the maximum acceptability of the acid value for cold-pressed oils at the level of 4.0 mg KOH / g of fat.
- The distribution of fatty acids in triacylglycerols in M2 oil is typical for vegetable fats. The fatty acids in the internal position are mainly unsaturated fatty acids: linoleic, oleic. On the other hand, in the external positions there are palmitic and stearic saturated fatty acids.
- In the case of apricot kernel oil M1, stearic acid has a large share in the internal position. Due to this distribution of fatty acids, this oil can be valuable in terms of nutrition in the diet of people with digestive disorders and lipid absorption.
- Induction time of the tested oils decreased with increase in temperature. The M2 apricot kernel oil with the highest content of polyunsaturated fatty acid was characterized by lower induction time in each temperature range (187.20 min. in 100˚C to 6.35 min. in 140˚C) compared to M1 oil, for which induction times ranged from over 700 min. at 100˚C to 31.15 min. at 140˚C.
- The analyzed oils were characterized by the presence of endothermic peaks at low temperatures, which means that a small amount of energy is needed to melt the already liquid oils. This is attributed to the presence of triacylglycerol fractions with a high proportion of mono- and polyunsaturated acids, which confirms the fatty acid composition of the analyzed oils.